California STAR Mathematics
Grades 8, 9, 10, 11
Augmentation Blueprint Summaries

Stanford with Augmentation		Content Standards/ # of items / %			
Grade	Test	Algebra I # / %	Geometry # / %	Algebra II # / %	Statistics # / %
8	Algebra I	50 / 100%			
9	Geometry		50 / 100%		
10	Algebra II			42 / 84%	8 / 16%
8	Integrated 1	39 / 78%	11 / 22%		
9	Integrated 2	11 / 22%	36 / 72%	2* / –	1* / 9%
10	Integrated 3		3 / 6%	43 / 86%	4/ 8%
11	Grade 11	11 / 22%	14 / 28%	18 / 36%	7 / 14%

Augmentation Only		Content Standards/ # of items / %			
Grade	Test	Algebra I # / %	Geometry # / %	Algebra II # / %	Statistics # / %
	Algebra I	35 / 100%			
	Geometry		35 / 100%		
	Algebra II			29 / 83%	6 / 17%
	Integrated 1	24 / 69%	11 / 31%		
	Integrated 2	11 / 31%	21 / 60%	2* / –	1* / 9%
	Integrated 3		3 / 9%	30 / 86%	2 / 6%
11	Grade 11	8 / 23%	11 / 31%	11 / 31%	5 / 14%

*The Algebra II standards chosen involve statistics and are added to the Statistics %.

California STAR
Course-Specific Augmentation Blueprints

Grade 8: Advanced 2 - Algebra I	SAT 9 Items	Aug. Items	Total Items
1.1 Students use properties of numbers to demonstrate that assertions are true or false.	0	2	2
2. Students understand and use such operations as taking the opposite, reciprocal, raising to a power, and taking a root. This includes the understanding and use of the rules of exponents.	2	2	4
3. Students solve equations and inequalities involving absolute values.	0	2	2
4. Students simplify expressions prior to solving linear equations and inequalities in one variable such as 3(2x-5) + 4(x-2) = 12.	0	2	2
5. Students solve multi-step problems, including word problems, involving linear equations and linear inequalities in one variable, with justification of each step.	8	2	10
6. Students graph a linear equation, and compute the x- and y-intercepts (e.g., graph 2x + 6y = 4). They are also able to sketch the region defined by linear inequality (e.g., sketch the region defined by 2x + 6y < 4).	0	2	2
7. Students verify that a point lies on a line given an equation of the line. Students are able to derive linear equations using the point-slope formula.	0	1	1
8. Students understand the concepts of parallel and perpendicular lines and how their slopes are related. Students are able to find the equation of a line perpendicular to a given line that passes through a given point.	2	2	4
9. Students solve a system of two linear equations in two variables algebraically, and are able to interpret the answer graphically. Students are able to use this to solve a system of two linear inequalities in two variables, and to sketch the solution sets.	1	2	3
10. Students add, subtract, multiply and divide monomials and polynomials. Students solve multistep problems, including word problems, using these techniques.	0	2	2

Grade 8: Advanced 2 - Algebra I	SAT 9 Items	Aug. Items	Total Items
11. Students apply basic factoring techniques to second and simple third degree polynomials. These techniques include finding a common factor to all of the terms in a polynomial and recognizing the difference of two squares, and recognizing perfect squares of binomials.	0	1	1
12. Students simplify fractions with polynomials in the numerator and denominator by factoring both and reducing to lowest terms.	0	2	2
13. Students add, subtract, multiply, and divide rational expressions and functions. Students solve both computationally and conceptually challenging problems using these techniques.	0	1	1
14. Students solve a quadratic equation by factoring or completing the square.	0	3	3
16. Students understand the concepts of a relation and a function, determine whether a given relation defines a function, and give pertinent information about given relations and functions.	2	2	4
17. Students determine the domain of independent variables, and range of dependent variables defined by a graph, a set of ordered pairs, or symbolic expression.	0	1	1
19. Students know the quadratic formula and are familiar with its proof by completing the square.	0	1	1
20. Students use the quadratic formula to find the roots of a second degree polynomial and to solve quadratic equations.	0	1	1
21. Students graph quadratic functions and know that their roots are the x-intercepts.	0	1	1
22. Students use the quadratic formula and/or factoring techniques to determine whether the graph of a quadratic function will intersect the x-axis in zero, one, or two points.	0	1	1
23. Students apply quadratic equations to physical problems such as the motion of an object under the force of gravity.	0	2	2
Total Items	15	35	50

California STAR
Course-Specific Augmentation Blueprints

Grade 9: TASK 1 - Geometry	SAT 9 Items	Aug. Items	Total Items
1. Students demonstrate understanding by identifying and giving examples of undefined terms, axioms, theorems, and inductive and deductive reasoning.	1	2	3
2. Students write geometric proofs, including proofs by contradiction.	0	2	2
3. Students construct and judge the validity of a logical argument. This includes giving counter examples to disprove a statement.	0	3	3
5. Students prove triangles are congruent or similar and are able to use the concept of corresponding parts of congruent triangles.	0	3	3
6. Students know and are able to use the Triangle Inequality Theorem.	0	1	1
7. Students prove and use theorems involving the properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of circles.	0	3	3
8. Students know, derive, and solve problems involving perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.	7	2	9
9. Students compute the volumes and surface areas of prisms, pyramids, cylinders, cones, and spheres.	0	2	2
10. Students compute areas of polygons including rectangles, scalene triangles, equilateral triangles, rhombi, parallelograms, and trapezoids.	1	1	2
11. Students determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and solids.	0	1	1
12. Students find and use measures of sides, interior and exterior angles of triangles and polygons to classify figures and solve problems.	1	3	4
13. Students prove relationships between angles in polygons using properties of complementary, supplementary, vertical, and exterior angles.	0	1	1
16. Students perform basic constructions with straightedge and compass such as angle bisectors, perpendicular bisectors, and the line parallel to a given line through a point off the line.	0	1	1

	Grade 9: TASK 1 - Geometry	SAT 9 Items	Aug. Items	Total Items
17.	Students prove theorems using coordinate geometry, including the midpoint of a line segment, distance formula, and various forms of equations of lines and circles.	4	1	5
18.	Students know the definitions of the basic trigonometric functions defined by the angles of a right triangle. They also know and are able to use elementary relationships between them, (e.g., $\tan(x) = \sin(x)/\cos(x)$, $(\sin(x))^2 + (\cos(x))^2 = 1$).	0	2	2
20.	Students know and are able to use angle and side relationships in problems with special right triangles such as 30-60-90 triangles and 45-45-90 triangles.	0	2	2
21.	Students prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles.	0	3	3
22.	Students know the effect of rigid motions on figures in the coordinate plane and space, including rotations, translations, and reflections.	1	2	3
	Total Items	15	35	50

California STAR
Course-Specific Augmentation Blueprints

Grade 10: Task 2 - Algebra II	SAT 9 Items	Aug. Items	Total Items
1. Students solve equations and inequalities involving absolute value.	0	1	1
2. Students solve systems of linear equations and inequalities (in two or three variables) simultaneously, by substitution, graphically, or with matrices.	9	3	12
3. Students are adept at operations on polynomials, including long division.	0	1	1
4. Students factor polynomials representing the difference of squares, perfect square trinomials, and the sum and difference of two cubes.	0	1	1
5. Students demonstrate knowledge of how real and complex numbers are related both arithmetically and graphically. In particular, they can plot complex numbers as points in the plane.	0	2	2
6. Students add, subtract, multiply, and divide complex numbers.	0	2	2
7. Students add, subtract, multiply, divide, reduce and evaluate rational expressions with monomial and polynomial denominators, and simplify complicated fractions including fractions with negative exponents in the denominator.	0	3	3
8. Students solve and graph quadratic equations by factoring, completing the square, or using the quadratic formula. Students apply these techniques in solving word problems. They also solve quadratic equations in the complex number system.	0	2	2
9. Students demonstrate and explain the effect changing a coefficient has on the graph of quadratic functions. That is, students can determine how the graph of a parabola changes as a, b, and c vary in the equation $y = a(x-b)^2 + c$.	0	1	1
10. Students graph quadratic functions and determine the maxima, minima, and zeros of the function.	2	2	4
11.1 Students understand the inverse relationship between exponents and logarithms, and use this relationship to solve problems involving logarithms and exponents.	0	1	1
11.2 Students judge the validity of an argument based on whether the properties of real numbers, exponents, and logarithms have been applied correctly at each step.	0	3	3

	Grade 10: Task 2 - Algebra II	SAT 9 Items	Aug. Items	Total Items
12	Students know the laws of exponents, understand exponential functions, and use these functions in problems involving exponential growth and decay.	0	2	2
14.	Students understand and use the properties of logarithms to simplify logarithmic numeric expressions and identify their approximate values.	0	1	1
15.	Students determine if a specific algebraic statement involving rational expressions, radical expressions, logarithmic or exponential functions, is sometimes true, always true, or never true.	1	2	3
17.	Given a quadratic equation of the form $ax^2 + by^2 + cx + dy + e = 0$, students can use the method of completing the square to put the equation into standard form and can recognize whether its graph is a circle, ellipse, parabola, or hyperbola. Students can then graph the equation.	0	1	1
18.	Students use fundamental counting principles to compute combinations and permutations.	0	1	1
19.	Students use combinations and permutations to compute probabilities.	0	1	1
20.	Students know the Binomial Theorem and use it to expand binomial expressions which are raised to positive integer powers.	0	1	1
22.	Students find the general term and the sums of arithmetic series and both finite and infinite geometric series.	1	1	2
	Probability/Statistics			
2.	Students know the definition of conditional probability, and use it to solve for probabilities in finite sample spaces.	1	1	2
7.	Students demonstrate understanding of the standard distributions (normal, binomial, and exponential), and can use them to solve for events in problems where the distribution belongs to these families.	1	2	3
	Total Algebra II/Statistics Items	15	35	50

California STAR
Integrated Series Augmentation Blueprints

Grade 8: Advanced 2 - Integrated 1		SAT 9 Items	Aug. Items	Total Items
	Algebra I Content Standards			
2.	Students understand and use such operations as taking the opposite, reciprocal, raising to a power, and taking a root. This includes the understanding and use of the rules of exponents.	2	2	4
4.	Students simplify expressions prior to solving linear equations and inequalities in one variable such as 3(2x-5) + 4(x-2) = 12.	0	2	2
5.	Students solve multi-step problems, including word problems, involving linear equations and linear inequalities in one variable, with justification of each step.	8	2	10
6.	Students graph a linear equation, and compute the x- and y-intercepts (e.g., graph 2x + 6y = 4). They are also able to sketch the region defined by linear inequality (e.g., sketch the region defined by 2x + 6y < 4).	0	2	2
7.	Students verify that a point lies on a line given an equation of the line. Students are able to derive linear equations using the point-slope formula.	0	1	1
8.	Students understand the concepts of parallel and perpendicular lines and how their slopes are related. Students are able to find the equation of a line perpendicular to a given line that passes through a given point.	2	2	4
9.	Students solve a system of two linear equations in two variables algebraically, and are able to interpret the answer graphically. Students are able to use this to solve a system of two linear inequalities in two variables, and to sketch the solution sets.	1	2	3
10.	Students add, subtract, multiply and divide monomials and polynomials. Students solve multistep problems, including word problems, using these techniques.	0	2	2
11.	Students apply basic factoring techniques to second and simple third degree polynomials. These techniques include finding a common factor to all of the terms in a polynomial and recognizing the difference of two squares, and recognizing perfect squares of binomials.	0	1	1

Grade 8: Advanced 2 - Integrated 1		SAT 9 Items	Aug. Items	Total Items
12.	Students simplify fractions with polynomials in the numerator and denominator by factoring both and reducing to lowest terms.	0	2	2
13.	Students add, subtract, multiply, and divide rational expressions and functions. Students solve both computationally and conceptually challenging problems using these techniques.	0	1	1
14.	Students solve a quadratic equation by factoring or completing the square.	0	3	3
16.	Students understand the concepts of a relation and a function, determine whether a given relation defines a function, and give pertinent information about given relations and functions.	2	0	2
19.	Students know the quadratic formula and are familiar with its proof by completing the square.	0	1	1
20.	Students use the quadratic formula to find the roots of a second degree polynomial and to solve quadratic equations.	0	1	1
Geometry Content Standards				
3.	Students construct and judge the validity of a logical argument. This includes giving counter examples to disprove a statement.	0	1	1
5.	Students prove triangles are congruent or similar and are able to use the concept of corresponding parts of congruent triangles.	0	1	1
6.	Students know and are able to use the Triangle Inequality Theorem.	0	1	1
8.	Students know, derive, and solve problems involving perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.	0	2	2
9.	Students compute the volumes and surface areas of prisms, pyramids, cylinders, cones, and spheres.	0	2	2
10.	Students compute areas of polygons including rectangles, scalene triangles, equilateral triangles, rhombi, parallelograms, and trapezoids.	0	1	1
11.	Students determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and solids.	0	1	1

Grade 8: Advanced 2 - Integrated 1		SAT 9 Items	Aug. Items	Total Items
12.	Students find and use measure of sides, interior and exterior angles of triangles and polygons to classify and solve problems.	0	1	1
17.	Students prove theorems using coordinate geometry, including the midpoint of a line segment, distance formula, and various forms of equations of lines and circles.	0	1	1
	Total Items	15	35	50

California STAR
Integrated Series Augmentation Blueprints

Grade 9: TASK 1 - Integrated 2	SAT 9 Items	Aug. Items	Total Items
Algebra I Content Standards			
1.1 Students use properties of numbers to demonstrate that assertions are true or false.	0	2	2
3. Students solve equations and inequalities involving absolute values.	0	2	2
16. Students understand the concepts of a relation and a function, determine whether a given relation defines a function, and give pertinent information about given relations and functions.	0	2	2
17. Students determine the domain of independent variables, and range of dependent variables defined by a graph, a set of ordered pairs, or symbolic expression.	0	1	1
21. Students graph quadratic functions and know that their roots are the x-intercepts.	0	1	1
22. Students use the quadratic formula and/or factoring techniques to determine whether the graph of a quadratic function will intersect the x-axis in zero, one, or two points.	0	1	1
23. Students apply quadratic equations to physical problems such as the motion of an object under the force of gravity.	0	2	2
Geometry Content Standards			
1. Students demonstrate understanding by identifying and giving examples of undefined terms, axioms, theorems, and inductive and deductive reasoning.	1	2	3
2. Students write geometric proofs, including proofs by contradiction.	0	2	2
3. Students construct and judge the validity of a logical argument. This includes giving counter examples to disprove a statement.	0	2	2
5. Students prove triangles are congruent or similar and are able to use the concept of corresponding parts of congruent triangles.	0	2	2
7. Students prove and use theorems involving the properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of circles.	0	3	3
8. Students know, derive, and solve problems involving perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.	7	0	7

	Grade 9: TASK 1 - Integrated 2	SAT 9 Items	Aug. Items	Total Items
10.	Students compute areas of polygons including rectangles, scalene triangles, equilateral triangles, rhombi, parallelograms, and trapezoids.	1	0	1
12.	Students find and use measures of sides, interior and exterior angles of triangles and polygons to classify figures and solve problems.	1	2	3
13.	Students prove relationships between angles in polygons using properties of complementary, supplementary, vertical, and exterior angles.	0	1	1
16.	Students perform basic constructions with straightedge and compass such as angle bisectors, perpendicular bisectors, and the line parallel to a given line through a point off the line.	0	1	1
17.	Students prove theorems using coordinate geometry, including the midpoint of a line segment, distance formula, and various forms of equations of lines and circles.	4	0	4
18.	Students know the definitions of the basic trigonometric functions defined by the angles of a right triangle. They also know and are able to use elementary relationships between them, (e.g., tan(x) = sin(x)/cos(x), $(\sin (x))^2 + (\cos (x))^2 = 1$).	0	2	2
20.	Students know and are able to use angle and side relationships in problems with special right triangles, such as 30-60-90 triangles and 45-45-90 traingles.	0	2	2
22.	Students know the effect of rigid motions on figures in the coordinate plane and space, including rotations, translations, and reflections.	1	2	3
Algebra II Content Standards				
18.	Students use fundamental counting principles to compute combinations and permutations.	0	1	1
19.	Students use combinations and permutations to compute probabilities.	0	1	1
Statistics/Probability Content Standards				
7.	Students demonstrate understanding of the standard distributions (normal, binomial, and exponential), and can use them to solve for events in problems where the distribution belongs to these families.	0	1	1
	Total Items	15	35	50

California STAR
Integrated Series Augmentation Blueprints

Grade 10: TASK 2 - Integrated 3	SAT 9 Items	Aug. Items	Total Items
Geometry Content Standards			
21. Students prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles.	0	3	3
Algebra II Content Standards			
1. Students solve equations and inequalities involving absolute value.	0	1	1
2. Students solve systems of linear equations and inequalities (in two or three variables) simultaneously, by substitution, graphically, or with matrices.	9	3	12
3. Students are adept at operations on polynomials, including long division.	0	1	1
4. Students factor polynomials representing the difference of squares, perfect square trinomials, and the sum and difference of two cubes.	0	1	1
5. Students demonstrate knowledge of how real and complex numbers are related both arithmetically and graphically. In particular, they can plot complex numbers as points in the plane.	0	2	2
6. Students add, subtract, multiply, and divide complex numbers.	0	2	2
7. Students add, subtract, multiply, divide, reduce and evaluate rational expressions with monomial and polynomial denominators, and simplify complicated fractions including fractions with negative exponents in the denominator.	0	3	3
8. Students solve and graph quadratic equations by factoring, completing the square, or using the quadratic formula. Students apply these techniques in solving word problems. They also solve quadratic equations in the complex number system.	0	2	2
9. Students demonstrate and explain the effect changing a coefficient has on the graph of quadratic functions. That is, students can determine how the graph of a parabola changes as a, b, and c vary in the equation $y = a(x-b)^2 + c$.	0	1	1
10. Students graph quadratic functions and determine the maxima, minima, and zeros of the function.	2	2	4
11.1 Students understand the inverse relationship between exponents and logarithms, and use this relationship to solve problems involving logarithms and exponents.	0	1	1

	Grade 10: TASK 2 - Integrated 3	SAT 9 Items	Aug. Items	Total Items
11.2	Students judge the validity of an argument based on whether the properties of real numbers, exponents, and logarithms have been applied correctly at each step.	0	3	3
12.	Students know the laws of exponents, understand exponential functions, and use these functions in problems involving exponential growth and decay.	0	2	2
14.	Students understand and use the properties of logarithms to simplify logarithmic numeric expressions and identify their approximate values.	0	1	1
15.	Students determine if a specific algebraic statement involving rational expressions, radical expressions, logarithmic or exponential functions, is sometimes true, always true, or never true.	1	2	3
17.	Given a quadratic equation of the form $ax^2 + by^2 + cx + dy + e = 0$, students can use the method of completing the square to put the equation into standard form and can recognize whether its graph is a circle, ellipse, parabola, or hyperbola. Students can then graph the equation.	0	1	1
20.	Students know the Binomial Theorem and use it to expand binomial expressions which are raised to positive integer powers.	0	1	1
22.	Students find the general term and the sums of arithmetic series and both finite and infinite geometric series.	1	1	2
Statistics/Probability Content Standards				
2.	Students know the definition of conditional probability, and use it to solve for probabilities in finite sample spaces.	1	1	2
7.	Students demonstrate understanding of the standard distributions (normal, binomial, and exponential), and can use them to solve for events in problems where the distribution belongs to these families.	1	1	2
	Total Items	15	35	50

California STAR
Augmentation Blueprints

Grade 11 STAR Mathematics	SAT 9 Items	Aug. Items	Total Items
Algebra I Content Standards			
5. Students solve multi-step problems, including word problems, involving linear equations and linear inequalities in one variable, with justification of each step.	2	1	3
10. Students add, subtract, multiply and divide monomials and polynomials. Students solve multistep problems, including word problems, using these techniques.	0	1	1
12. Students simplify fractions with polynomials in the numerator and denominator by factoring both and reducing to lowest terms.	0	1	1
14. Students solve a quadratic equation by factoring or completing the square.	0	1	1
15. Students apply algebraic techniques to rate problems, work problems, and percent mixture problems.	1	2	3
23. Students apply quadratic equations to physical problems such as the motion of an object under the force of gravity.	0	2	2
Geometry Content Standards			
4. Students prove basic theorems involving congruence and similarity.	0	2	2
9. Students compute the volumes and surface areas of prisms, pyramids, cylinders, cones, and spheres.	0	2	2
15. Students use the Pythagorean Theorem to determine distance and find missing lengths of sides of right triangles.	1	2	3
17. Students prove theorems using coordinate geometry, including the midpoint of a line segment, distance formula, and various forms of equations of lines and circles.	1	2	3
18. Students know the definitions of the basic trigonometric functions defined by the angles of a right triangle. They also know and are able to use elementary relationships between them, (e.g., $\tan(x) = \sin(x)/\cos(x)$, $(\sin(x))^2 + (\cos(x))^2 = 1$).	1	2	3
21. Students prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles.	0	1	1

Grade 11 STAR Mathematics	SAT 9 Items	Aug. Items	Total Items
Algebra II Content Standards			
2. Students solve systems of linear equations and inequalities (in two or three variables) simultaneously, by substitution, graphically, or with matrices.	3	2	5
10. Students graph quadratic functions and determine the maxima, minima, and zeros of the function.	2	2	4
12. Students know the laws of exponents, understand exponential functions, and use these functions in problems involving exponential growth and decay.	0	1	1
14. Students understand and use the properties of logarithms to simplify logarithmic numeric expressions and identify their approximate values.	0	2	2
15. Students determine if a specific algebraic statement involving rational expressions, radical expressions, logarithmic or exponential functions, is sometimes true, always true, or never true.	1	1	2
17. Given a quadratic equation of the form $ax^2 + by^2 + cx + dy + e = 0$, students can use the method of completing the square to put the equation into standard form and can recognize whether its graph is a circle, ellipse, parabola, or hyperbola. Students can then graph the equation.	0	2	2
23. Students derive the summation formulas for arithmetic series and both finite and infinite geometric series.	1	1	2
Statistics/Probability Content Standards			
2. Students know the definition of conditional probability, and use it to solve for probabilities in finite sample spaces.	1	3	4
7. Students demonstrate understanding of the standard distributions (normal, binomial, and exponential), and can use them to solve for events in problems where the distribution belongs to these families.	1	2	3
Total Items	15	35	50